HAZARDOUS MATERIALS RESPONSE GUIDELINES FOR WEST PLAINFIELD FIRE DEPARTMENT

EXECUTIVE ANALYSIS OF FIRE SERVICE OPERATIONS IN EMERGENCY MANAGEMENT

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ABSTRACT

The problem was that West Plainfield Fire Department personnel were not aware of all of the hazardous materials that were stored in, or transported through, the district. Consequently, the department did not have adequate guidelines for response to hazardous materials incidents within its jurisdiction. The purpose of the research was to identify potential hazardous materials incidents in the West Plainfield Fire Protection District and to provide guidelines for safe service delivery at such incidents.

The action research method was used to identify (1) the hazardous materials that commonly were stored in, or were transported through, the district, (2) the identified hazardous materials or locations which were most likely to result in a hazardous materials incident requiring response by department personnel, (3) items commonly included in guidelines for response to hazardous materials incidents, and (4) the training requirements for safe response to hazardous materials incidents by a fire protection district.

The procedures included research of codes, statutes, and rules and regulations governing response to hazardous materials incidents by a fire protection district. In order to determine the types of hazardous materials likely to be found in the district, county documents were reviewed, individuals were interviewed, and transportation of materials through the district were observed. Periodicals, publications and other departments' operating guidelines and preplans were also reviewed.

The resultant guidelines for response by West Plainfield Fire Department personnel to hazardous materials incidents identified 14 "hazards," addressed training requirements and provided guidelines for safe service delivery at hazardous materials incidents. It was recommended that the department adopt the resultant hazardous materials response guidelines. It

was further recommended that (1) the department amend its mission statement, (2) within the next six months the department train toward the identified hazards, (3) the next six months the department promulgate specific response guidelines targeted at specific hazards, and (4) that joint training exercises be scheduled with the county's hazardous materials response team.

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INTRODUCTION

The West Plainfield Fire Protection District ("district") provides fire and emergency response to a 33-square mile rural, unincorporated area, in Yolo County, California. The problem is that West Plainfield Fire Department personnel are not aware of all of the hazardous materials that are stored in, or are transported through, the district. Consequently, the department does not have adequate guidelines for response to hazardous materials incidents within its jurisdiction. The purpose of this research is to identify potential hazardous materials responses in the West Plainfield Fire Protection District and to provide guidelines for response to those incidents. The resultant guidelines will satisfy current regulations and standards and will respond to future requirements and mandates for safe service delivery at hazardous materials incidents.

The action research method was used to answer the following questions to facilitate preparation of applicable response guidelines:

1. What hazardous materials are commonly stored in, or transported through, the district?
2. Of the identified hazardous materials, which are most likely to result in a hazardous materials incident requiring response by West Plainfield Fire Department personnel?
3. What should be included in guidelines for response to hazardous materials incidents?
4. What are the training requirements for safe response to hazardous materials incidents by a fire protection district?

BACKGROUND AND SIGNIFICANCE

The West Plainfield Fire Department has been providing fire protection and related services to the residents and businesses of, and visitors to, the West Plainfield Fire Protection District since 1928. The district is located in rural Yolo County, California, and covers 33 square miles. The district is populated by approximately 320 households, one church, one elementary school, numerous household businesses, a bar and restaurant, one company dealing with biohazards, several agricultural businesses, and the Yolo County Airport (an uncontrolled airport designated as an alternative landing site for Sacramento International Airport). The majority of residents and businesses use propane to heat their homes and to cook their meals. Pacific Gas and Electric Company has natural gas lines to a limited number of homes and businesses in the district and SMUD runs a 20" natural gas pipeline (with shutoff valve) through the district. The main industry in the district is farming.

The fire department has mutual aid agreements with all other departments in Yolo County, California, and with a few departments in neighboring counties. It also has automatic aid agreements for responses to structure fires with the Davis and Winters Fire Departments. The University of California Fire Department Hazardous Materials Response Team is supplemented with members provided by Davis, West Sacramento and Woodland Fire Departments, which is then known as the Yolo County Hazardous Materials Response Team.

Currently, the District has one paid firefighter/emergency medical technician who works Monday through Friday, 8:30 am to 5:00 pm. There are 15 volunteer members on the roster, half of whom do not reside in the District. All members are provided with all personal protective equipment required by law for fighting fires and providing emergency medical services, and use it. Members are required to train three times per month. The average requests for service number

110 per year, of which three are for responses to hazardous materials incidents. The mean response by members to an incident is three. The mean response time per incident is seven minutes.

When the West Plainfield Fire Department was first organized in 1928, citizens expected service only if they had a fire. Today, a fire department may be expected to provide many additional services, including public assistance, prevention and inspection, emergency medical services, specialized rescues (i.e., swift water, confined space, trench), and hazardous materials release mitigation.

Recognizing that the department could not provide every service imaginable, in 1994 the department wrote, and published to its residents and members, its first mission statement. The statement was revised in 1999 (see Appendix A). Essentially, the department provides fire prevention and suppression services, response to hazardous materials incidents, emergency medical services, specialized rescue services, code enforcement, and public assistance. Note that the reference to response to hazardous materials incidents is vague, referring to "HazMat: first responder level."

In the past, members responded to hazardous materials incidents with little regard for their safety, often not wearing appropriate protective clothing and responding directly to the scene without thought about routes of travel and how weather might affect the incident. Few had little, if any, knowledge of how to handle the material or its potential affects on them and members of the public, except for that gained from farming and their own use of pesticides, fertilizers and fuel. Most of the department's members were farmers living in the district and were personally familiar with the hazardous materials stored in, and transported through, the district.

Presently, only a few members of the department farm their land and are, therefore, somewhat familiar with pesticides and fertilizers. Most of the members now work outside the district and have no idea about what hazardous materials might be stored in, or traveling through, the district. While there is a current response guideline for responses to hazardous materials incidents (see Appendix B), the guideline does not require that training be provided specifically to the types of materials to be found in, or traveling through, the district, nor does it identify the types of hazards likely to be encountered. In fact, no one member, volunteer or paid, can give a true picture of the hazardous materials stored in, or traveling through, the district.

The purpose of this paper is to provide members with the information necessary for safe response to future hazardous materials incidents, including identification of the hazards to be found in, or traveling through, the district. The resulting guideline is meant to be dynamic, requiring at least annual review and update.

The goal of the National Fire Academy's *Executive Analysis of Fire Service Operations in Emergency Management* course is to prepare staff in the "functions necessary to manage the operational component of a fire and rescue department effectively." (National Fire Academy, 2001, p. SM1-3). The lack of comprehensive guidelines for response to hazardous materials incidents in the West Plainfield Fire Protection District adversely impacts the department's ability to manage that operational sub-component of the department effectively. The risk assessment portions of the Academy's *Executive Analysis of Fire Service Operations in Emergency Management* course are utilized herein to identify likely hazardous materials incidents within the district in order that appropriate response guidelines can be formulated.

LITERATURE REVIEW

As noted earlier, fire departments are providing more services to their communities than ever before. "'When you don't know who to call, you call the fire department' has become a sort of unwritten social contract with our communities" (de Lisi, 2002, p. 91). Add to that the fact that "the number of releases in our country are increasing" (Peterson, 2001, p. 6) and, of course, increased call volume is the result. Then, remember that "nearly 12 percent of all victims at these releases are first responders" (Peterson, 2001, p. 7). Those are scary statistics that highlight the need for proper planning for response to hazardous materials incidents. We tend to rush in without much though because "all of us have been trained to enter the building at a structure fire with the least delay and 'slay the dragon'.""It has been proven that this approach is not the way hazmat emergencies should be handled because rushing in leads to needless hazmat exposures" (Peterson, n.d., p. 3). It is the unknown, perhaps colorless and even odorless, hazards that will get us. We must become aware of the hazardous materials that we might encounter and respond in an orderly, consistent, safe manner.

To begin this discovery process, consider that "more than 800,000 hazardous-materials shipments are made daily in the United States" (Moses, 2002, p. 2). How many of those are made in the West Plainfield Fire Protection District? West Plainfield Fire Department personnel have not even a vague idea of the shipments made through its district or where those materials are stored once delivered to customers in the district. Moses further points out that "local and state regulatory agencies are becoming stricter about enforcing spill notification requirements" (2002, p. 17), which will increase the department's awareness of the hazards stored in and transported through the district.

In order to begin to understand the nature of the hazardous materials transported through the district, the author observed transportation of marked hazardous materials through the district in order to identify the companies that provided the transportation service. Each of the pesticide and fertilizer companies – Growers Air Service, Agriform, and John Taylor/Roy Riegels – was telephoned and a company representative (Ralph Holsclaw with Growers Air Service, the receptionist at Agriform, and Jimmy at John Taylor/Roy Riegels) was asked to identify the products most usually transported through, or stored in, the district, including the typical amount of each. Viking Propane, Suburban Propane and Northern Energy, the fuel transporters, were each telephoned and the receptionist was requested to provide delivery vehicle size and average storage tank size for residential and commercial (farming) use.

Next, Dan Carroll, the California Highway Patrol officer in charge of hazardous materials transportation through Yolo County, California, was interviewed as to his knowledge of the types of materials transported through the district. Lastly, Dave Daley, manager, Yolo County Municipal Airport, was interviewed as to his knowledge of the types of materials transported through the airport.

With respect to hazardous materials stored in the district, it should be noted that 19 CCR 2729.2 (California Code of Regulations, 2000) requires that each business that handles a hazardous material or a mixture containing a hazardous material will submit to the Certified Unified Program Agency (CUPA) “The Hazardous Materials - Chemical Description Page” form provided by the California Office of Emergency Services. The CUPA in Yolo County is the County of Yolo Department of Environmental Health (“Yolo County DEH”). From those filings, the Yolo County DEH then prepares a “Facilities Hazardous Materials Inventory Report” for each entity required to file “The Hazardous Materials - Chemical Description Page.” Those

inventory reports are then provided to each fire department. Each of those documents was examined in order to identify the hazardous materials stored at each location.

Once the hazardous materials stored in, or transported through, the district are identified, attention must then be given to determining which hazardous materials might result in requests for service by the fire department. “Looking at trends can assist in preparing for the future and helping to target energies.” (Peterson, 2001, p. 2). With this in mind, department members Ed Beoshanz, Walt Jarrett and Bob Corcoran, each of whom have at least 40 years with the West Plainfield Fire Department, were interviewed regarding past hazardous materials incidents that had not been captured in the department’s records management system. Each person was able to provide information about types of hazardous materials the department has responded to in the past. While none of the individuals could remember specific dates or amounts of materials involved, each was able to remember the types of materials, general amounts and the general location of each incident. This information was helpful in determining the potential hazards identified at Matrix 1 - Hazard Identification (Appendix C) and the vulnerability rating for each potential hazard identified at Matrix 2 - Vulnerability Assessment (Appendix C). This “risk assessment process provides a valuable source of information” (National Fire Academy, 2001, p. SM 4-4).

Proper training and awareness are vital. “Responders need a constant awareness of all hazards” and it is “paramount to know ‘what-to-do’ and ‘what-not-to-do’ at hazmat incidents” (Peterson, n.d., p. 7). “IAFF says firefighters are six times more likely to become injured at haz mat incidents than structure fires” (Peterson, 2000 November, p. 9). Title 29, Code of Federal Regulations, covers “emergency response operations for releases of, or substantial threats of releases of, hazardous substances without regard to location of the hazard” (29 CFR

1910.120(a)(1)(v)). The California counterpart is found at Title 8, California Code of Regulations, Section 5192(a)(1)(e). Within these regulations are found the different response levels and training requirements for each level.

"As emergency responders, we know there are many gray areas when it comes to our decision making, especially when it comes to hazardous materials (haz-mat) incidents. Standard operating procedures help to clarify our actions" (Peterson, 2000 March, p. 1). 29 CFR 1910.120(q) provides the guidelines for response to hazardous materials incidents.

Further, National Fire Protection Association (NFPA) 471 outlines "the minimum requirements that should be considered when responding to hazardous materials incidents" and specifies "operation guidelines for responding to hazardous materials incidents" (Section 1.2). NFPA 472 covers "the competencies for . . . first responders at the operational level, . . . incident commanders . . . " (Section 1.1.2). NFPA 473 identifies "the levels of competence required of emergency medical services (EMS) personnel who respond to hazardous materials incidents" (Section 1.1).

Making sure you have "enough and correct information regarding chemicals in an accidental release can make the difference between successful emergency response and a potential disaster for local responders and the community" (Campbell, 1999, p. 3). The lists of hazardous materials provided by the businesses to the Yolo County DEH, the memories of district members about past hazardous materials responses, and the numerous personal interviews regarding storage and transportation of hazardous materials in the district were vital to preparation of the proposed response guidelines. The review of other departments' response guidelines provided the basis for the proposed West Plainfield Fire Department Hazardous Materials Response Guidelines (Appendix C). The attendant review of the state and federal

codes and regulations and the National Fire Protection Association guidelines solidified the department's commitment to responding at the hazardous materials first responder operations level.

PROCEDURES

The purpose of this applied research project is to determine guidelines for response to hazardous materials incidents in the West Plainfield Fire Protection District.

Research and data collection began with research of codes, statutes, and rules and regulations governing response to hazardous materials incidents by a fire protection district and training requirements. Periodicals, publications and other department's operating guidelines were also reviewed. In order to determine the types of hazardous materials likely to be found in the district, a review of county documents was conducted and individuals were interviewed, as follows:

1. The California Highway Patrol officer in charge of hazardous materials transportation through Yolo County, California, was asked for his best guess about what hazardous materials are transported through the district. He was also asked whether or not the district had any hazardous materials transportation routes located within its boundaries.

2. The Yolo County Municipal Airport manager was asked about any possible hazardous materials stored on the airport that are not reported to Yolo County DEH and whether or not any of the commercial aircraft that utilize the airport carry hazardous materials cargo.

3. Select West Plainfield Fire Department members were asked to share their memories of prior requests for service to hazardous materials incidents. Each was asked to

provide a time period, to the best of his or her knowledge, the type of material released, and the amount of material released.

4. The yellow pages portion of the Pacific Bell telephone book for Yolo County was reviewed for the telephone numbers of the pesticide, fertilizer, gasoline, propane and diesel dealers that were observed making deliveries in the district. Each of the pesticide and fertilizer companies (Growers Air Service, Agriform, and John Taylor/Roy Riegels) was telephoned and asked to identify the products most usually transported through, or stored in, the district, including the usual amount of each. Viking Propane, Suburban Propane and Northern Energy were each telephoned and requested to provide delivery vehicle size and average storage tank size for residential and commercial (farming) use.

All persons interviewed were able to provide the information requested, to the best of their knowledge. In addition, the author directed that the district's paid firefighter drive through the district and identify the gas wells.

The West Plainfield Fire Department records management system was reviewed for a list of hazardous materials responses since January 1, 2000. The department roster was used to obtain the telephone numbers of the three members (Ed Beoshanz, Walt Jarrett and Bob Corcoran) that would be interviewed regarding past hazardous materials incidents that had not been captured in the department's records management system.

The "Facilities Hazardous Materials Inventory Report" for each entity in the West Plainfield Fire Protection District required to file "The Hazardous Materials - Chemical Description Page" was reviewed to determine the hazardous materials located at each business.

Once the above information had been gathered, the risk assessment portion of the National Fire Academy's *Executive Analysis of Fire Service Operations in Emergency*

Management course, Unit 4 (2001), was used to identify the probability, vulnerability and risk rating of each hazard. The "Capability Shortfall Matrix Worksheet" was then used to assess capability shortfall for a "worse-case scenario" (National Fire Academy, 2001, SM 6-37). Each was then incorporated into the proposed response guidelines (Appendix C).

All of the author's Executive Fire Officer Program classmates and the University of California at Davis, California, Fire Department were asked to provide copies of hazardous materials response guidelines. Response guidelines from the city fire departments of Corpus Christi, Texas, Anaheim, California, Laguna Beach, California, Winter Park, Florida, Huntington Beach, California, Fountain Valley, California, and from the University of California at Davis Fire Department were received and reviewed for content.

The lack of easily mined historical data regarding responses to hazardous materials incidents prior to calendar year 2000, when department records were automated, made it necessary to rely on department members' memories of prior incidents. Therefore, it was not possible to statistically determine what hazardous materials incidents would be most likely to occur in the district. Additionally, Pacific Gas and Electric Company was able to provide the location of the single stretch of natural gas service in the district, but was unable to provide the actual number of residents or businesses along the potential service area that actually used the service; therefore, it was assumed for the purposes of this paper that all residences and businesses along the potential service area used the service.

Definition of Terms

"Mean response" is the number of units (time or personnel) that respond most often. The mean is found by counting the number of times each number occurs in the list of numbers being analyzed; the number that occurs most often is the "mean."

“Records management system” in this instance is the Access database program used to capture incident data for response to incidents by the West Plainfield Fire Department, including date, time, location, narrative, and numbers and types of personnel responding to the incident.

RESULTS

The interview with Dave Daley, manager, Yolo County Municipal Airport (personal communication, October 15, 2002) revealed that Grower’s Air Service leased a pad near the fire department for use in loading airplanes for fertilization purposes. He was not aware of any other hazardous materials stored or transported through the airport other than that reported to Yolo County DEH. It was determined that in February and March of each year, the district can expect to have 4-5 trailers of ammonia nitrate and sulfate, each carrying 28 tons, and uria nitrate ®. Holsclaw, personal communication, November 7, 2002).

Dan Carroll, the California Highway Patrol officer responsible for hazardous materials transportation in Yolo County, California, indicated that the University transports hazardous wastes, including radio active and corrosive materials, from a location in the district. He further confirmed that huge amounts of poisons, gas, propane, diesel and corrosives travel the district throughout the year. (Personal communication, October 23, 2002.)

The district drive-through performed by the district’s paid firefighter identified three gas wells in the district: on County Road 29 between County Roads 95 and 96, County Road 30 at County Road 98, and on Pierce Ranch Road. The author is also aware of a 20" natural gas pipeline valve at County Road 98 at County Road 28. The author’s observation of transportation of marked hazardous materials through the district indicated the need to contact the following

agencies: Viking Propane, Suburban Propane, Northern Energy, Agriform, and John Taylor/Roy Riegels. The following information was gathered from each:

1. Viking Propane (receptionist, personal communication, January 6, 2003):

   propane, 250 gallon residential tanks, 2,000-2,800 gallons in delivery truck.

2. Suburban Propane (receptionist, personal communication, January 6, 2003):

   propane, 250 gallon residential tanks, 2,500-3,000 gallons in delivery truck, largest storage is 30,000 gallons.

3. Northern Energy (receptionist, personal communication, January 6, 2003):

   fuels, 250 gallon residential tanks (95%) up to 499 gallon residential tanks (5%), 2,800 gallons in delivery truck.

4. Agriform (receptionist, personal communication, January 6, 2003):

   transport fertilizer in 1,000 gallon tanks, usually November through Spring, uria nitrate and 1034 0 (a mixture of 10% nitrogen, 34% phosphorus and 0% potash).

5. John Taylor/Roy Riegels (Jimmy, personal communication, January 6, 2003):

   transporting either aqua ammonia or 1034 0 in 4,000 gallon tanks.

The information gathered about the types of hazardous materials stored in the district as received from each of the Yolo County DEH “Facilities Hazardous Materials Inventory Report” forms for the reporting entities in the district is set out in Appendix E.

The interviews with Ed Beoshanz, Walt Jarrett and Bob Corcoran on January 21, 2003, revealed the following with respect to past requests for service to hazardous materials incidents:

1. 25 years ago at Russell Boulevard and County Road 98 - gasoline tanker spilled 5,000 gallons.

2. 25 years ago on County Road 30 between County Roads 96 and 98 - ruptured amonia tank.

3. Russell Boulevard and County Road 93A - diesel truck and trailer dumped 5,000 gallons.

4. County Road 31 at Country Road 96 - gas truck and trailer dumped 5,000 gallons.

5. County Road 29A at County Road 9E - sulfer dust spill.

6. County Road 31 at County Road 93A - diesel trap wagon.

7. County Road 31 at County Road 93A - weed sprayer spill.

8. County Road 29A, west of Russell Boulevard - overturned propane truck (empty).

Requests for hazardous materials responses from January 1, 2000, through December 30, 2002, were as follows:

1. In April 2000 on County Road 98 - anhydrous ammonia tank leak.

2. In September 2000 at Russell Boulevard and County Road 93A - fuel leak from overturned tomato truck.

3. In October 2000 at Russell Boulevard and County Road 96 - tractor applying fertilizer near elementary school during school hours.

4. In May 2001 on County Road 31 at County Road 96 - pesticides on the roadway.

5. In July 2001 on Pierce Ranch Road - pressure relieving on gas well.

6. In August 2001 on County Road 30 at County Road 98 - gas well venting.

7. In May 2002 on County Road 29 at County Road 94 - dump of approximately 30 paint, wax product, and waste oil containers.

8. In September 2002 on County Road 31 at County Road 95 - hydraulic oil spill.

The above information about the hazardous materials stored in and transported through the district, coupled with the above information with respect to requests for service to hazardous materials incidents was used to develop the list of potential hazards set out on Matrix 1, to assess the hazard probability for each (Matrix 1), to assess the vulnerability of each hazard as set out on Matrix 2, and to rate the risk of each hazard (Matrix 3) (Appendix C). The department's chief, assistant chief and paid firefighter all agreed on each of the assigned values on each Matrix. The "Capability Shortfall Matrix Worksheet" (National Fire Academy, 2001, SM 6-37) was then used to assess capability shortfall for a "worse-case scenario." By combining the two most frequent requests for service to hazardous materials incidents (fuel and fertilizers), a worse-case scenario of a commercial fertilizer transporter vs. the SMUD pipeline valve was chosen and analyzed.

Response guidelines are now necessary. It was decided to use a combination of the UC Davis Fire Department and City of Corpus Christie hazardous materials response guidelines, relevant parts of NFPA 471 and 472, and relevant parts of 29 CFR 1910.120 to formulate the proposed response to hazardous materials guidelines set out at Appendix C.

"Purpose," "Authority," "Policy," "Scope," "Scene Management," "Response Level," "Incident Classification," "Response Guidelines," "Decontamination," and "Training" sections were standard in all of the guidelines reviewed. In addition, the Corpus Christi guidelines contained a section entitled, "Assumptions" (City of Corpus Christi, 2000, Q-3), which was incorporated into the proposed guidelines (Appendix C).

NFPA 471 recommends training requirements, emergency incident operations components, personal protective clothing for the different response levels, a decontamination plan, and medical monitoring issues in "specifying operating guidelines for responding to

hazardous materials incidents." NFPA 472 recommends the competencies for each response level. 29 CFR 1910.120 covers the same materials, but more in-depth. Pertinent parts of each were incorporated into the proposed guidelines by reference to the code sections. All issues were addressed at the first responder operations and incident commander levels (29 CFR 1910.120(q)(6)(ii) and (q)(6)(v) and NFPA 472 Chapters 5 and 7).

DISCUSSION

"Hazardous materials response is inherently dangerous" (Peterson, n.d., p. 2) It is, as Peterson points out "paramount to know 'what-to-do' and 'what-not-to-do' at hazmat incidents" (n.d., p. 7). It is imperative that we do whatever we can to mitigate the potential harm to ourselves. This includes knowing what kinds of hazardous materials we might be expected to respond to and "how" properly to respond to them. Consequently, the purpose of this research paper was to do just that.

The journey began by identifying the hazards and the likelihood of a request for service with respect to the identified hazards. This "risk assessment process provides a valuable source of information for emergency management program planning, priority setting, and strategy development" (National Fire Academy, 2001, p. SM4-4). The process highlighted the magnitude of the potential hazardous materials response requests for service in the district, as well as the lack of proper training as to those potential hazards and their locations.

Given that "capability assessment is the key to preparedness," (National Fire Academy, 2001, p. SM6-3), once the potential hazards were identified and past requests for service were analyzed, a worse-case scenario was developed and studied with respect to anticipated shortfalls

in capability. The results are found in Matrix 3 in Appendix C. The author would not have expected the shortfalls that were identified.

"When you don't know who to call, you call the fire department" (de Lisi, 2002, p. 1). "A fundamental shift in the nature and character of the risks that the fire service was encountering occurred when the fire service became more actively involved in the emergency medicine field" (National Fire Academy, 2001, p. SM4-13). A similar shift occurred when the fire service became more actively involved in hazardous materials response because our communities expect it. It is important to note that not all departments respond at the same level. The West Plainfield Fire Department has chosen to respond at the first responder operations level. The response level drives the training and planning requirements.

The purpose of guidelines and regulations is to "reduce the numbers of accidents, injuries, and illnesses during response to hazardous materials incidents and to help prevent exposure to hazardous materials to reduce the possibility of fatalities, illness, and disabilities affecting emergency response personnel" (NFPA 472, May 2002, 1.2.2). For any number of reasons, including the fact that regulations are law and punishable in a court of law, the savy manager will endeavor to comply with pertinent regulations. Even guidelines, which do not have the weight of regulations, can impact a department legally if the guidelines are universally accepted as the "prudent" way to do business.

Regulations and guidelines abound with respect to hazardous materials response. For instance, 19 CCR 2729(a) provides "minimum standards for the hazardous materials business plan." These rules govern the information reported to the CUPAs regarding hazardous materials storage, which is then shared with the fire department to assist the department in planning for possible hazardous materials release mitigation. It should be noted, however, that not all

businesses comply with these requirements. There are a number of potential such businesses in the West Plainfield Fire Protection District (David Stiles, personal communication, January 15, 2003).

29 CFR 1910.120(a)(1)(v) and 8 CCR 5192(a)(1)(e) cover "emergency response operations for releases of, or substantial threats of releases of, hazardous substances without regard to the location of the hazard." Thus, these sections cover hazardous materials response by fire department personnel. NFPA 471 outlines "the minimum requirements that should be considered when dealing with responses to hazardous materials incidents" and specifies "operating guidelines for responding to hazardous materials incidents." (May 2002, 1.2.) At section 1.1.2 of NFPA 472, the stated scope is to "cover the competencies for first responders at the . . . first responder operational level, . . . incident commanders . . . " (May 2002). NFPA 473 is concerned with the "levels of competence required of emergency medical services (EMS) personnel who respond to hazardous materials incidents" (May 2002). Section 4.1.1 of NPFA 473 suggests that EMS personnel be "trained to meet at least the first responder awareness level."

It is impractical to include every little thing found in the numerous regulations and guidelines into a response guideline. For instance, not all parts of each regulation or guideline pertain to all departments. West Plainfield Fire Department personnel respond at the first responder operations level. It would be counterproductive to include sections governing response to hazardous materials incidents at the technical level, for instance.

"OSHA will allow Operations Level personnel to respond offensively to haz-mat incidents, provided each person on-site has had specific training in the task that is required" (Peterson, 2000 March, p. 23). While OSHA considers first responder operations level personnel

to be technically in violation of OHSA regulations, personnel "may be justified in going into a dangerous area (hot zone) at a haz-mat emergency when people injured at the haz-mat incident need to be rescued" (Peterson, 2000 March, p. 15). This research process has allowed the West Plainfield Fire Department to identify potential hazardous materials requests for service in its district. That information should be used to provide members with "specific training in the task that is required" if for no other reason than to be able to perform a rescue at a hazardous materials incident. This finding justifies the recommendation below that within the next six months the department train toward the identified potential hazards as outlined in the "West Plainfield Fire Department Hazardous Materials Response Guidelines" (Appendix C).

The goal of the National Fire Academy's *Executive Analysis of Fire Service Operations in Emergency Management* course is to prepare staff in the "functions necessary to manage the operational component of a fire and rescue department effectively." (National Fire Academy, 2001, p. SM1-3). This research, discussion and recommendations corrects the lack of preparedness identified by the West Plainfield Fire Department with respect to guidelines for response to hazardous materials incidents. Through the above-described process, likely hazards have been identified, the likelihood of specific occurrences requiring requests for service to hazardous materials incidents has been analyzed, and guidelines and future actions have been proposed and recommended. The department's ability to manage that operational sub-component effectively has been improved.

RECOMMENDATIONS

The proposed guidelines for response by West Plainfield Fire Department personnel to hazardous materials incidents (Appendix C) identifies 14 potential hazards, addresses training

requirements, requires at least annual review, and provides general guidelines for safe service delivery at hazardous materials incidents. It is recommended that:

1. The department immediately adopt the proposed “West Plainfield Fire Department Hazardous Materials Response Guidelines” (Appendix C).

2. The department amend its Mission Statement hazardous material objective to be: “isolate, deny entry, and contain.”

3. Within the next six months the department train toward the identified potential hazards as outlined in the “West Plainfield Fire Department Hazardous Materials Response Guidelines” (Appendix C).

4. Within the next six months, more specific response guidelines be promulgated for each identified potential hazard and that such guidelines be incorporated into the “West Plainfield Fire Department Hazardous Materials Response Guidelines” (Appendix C).

5. Annual joint training exercises be scheduled with the county’s hazardous materials response team.

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APPENDIX A
MISSION STATEMENT

MISSION STATEMENT
WEST PLAINFIELD FIRE PROTECTION DISTRICT
(Revised January 1999)

Mission

Provide, safely and to the best of our ability, fire suppression, emergency medical services, other emergency services within our scope, and public assistance to residents and visitors to the West Plainfield Fire Protection District. Also to provide, safely and to the best of our ability, mutual aid to surrounding fire districts upon request. While we understand that we are a public safety organization, safety of our firefighters is paramount to us.

Objectives

Fire suppression:	single family dwelling small business sprinklered business educational occupancy buildings of assembly brush / grass
EMS:	non-transporting BLS care @ an EMT-1 level
Rescue:	vehicle / aircraft structural or other fires
Aircraft:	fire suppression rescue / EMS
Fire prevention:	inspection education
HazMat:	first responder level
Public Assistance:	need arising from unforeseen circumstances
Mutual Aid:	as per agreement

APPENDIX B
HAZARDOUS MATERIALS RESPONSE GUIDELINES - 1991

STANDARD OPERATING PROCEDURE - HAZARDOUS MATERIALS INCIDENTS

RESPONSE (TO STATION):

All responding personnel will report to the station to receive assignments. Officers or the paid man will decide on the type and direction of response - after considering atmospheric conditions; i.e., wind direction, rain, terrain), and nature of reported hazardous material.

Respond so as to avoid the spill, gas cloud, etc. Remember - WE ARE NOT TRAINED OR EQUIPPED TO HANDLE HAZARDOUS MATERIALS. Hazardous materials are not our primary responsibility. We are asked to respond because we are closer and more accessible. CHP and the Yolo County Haz Mat Task Force and specialists should be called.

SAFETY -- Be Alert!!

It is imperative that all personnel follow instructions to maintain the safety of fellow fire fighters.

Incident Command should place someone in charge of taking names and the length of time department personnel may have been exposed to an unknown substance.

-- Determine if there is a problem before taking any action and remember:

- not all hazardous materials are placarded
- placards could be missing
- some materials are hazardous in certain conditions

HANDLING THE INCIDENT:

-- Call fire control and ask them to notify the proper agencies

- Environmental Health and Safety (advisory capacity only)
- Yolo County Ag Department
- Yolo County Haz Mat Task Force
- CHP
- Public Works
- Sheriff
- Any other necessary agencies (Fish and Game, etc.)

-- Set up command post
- CHP is incident command on highways; Sheriff, private areas

Standard Operating Procedure -
Hazardous Material Incidents (Continued)

HANDLING THE INCIDENT (Continued):

-- Assign a safety officer

-- Set up protective perimeters

- **STAY OUT OF THE AREA IF POSSIBLE** - keep all non-emergency persons and non-assigned, non-essential department personnel out of the area - PERSONNEL NOT SPECIFICALLY TRAINED ARE NOT TO ENTER
- Evacuate the area if necessary

-- Try to SAFELY identify the material and its hazards

- Use binoculars, log sheets, bills of lading
- Determine the type of hazard -health, fire, explosion
- When determining the type of hazard, use as many resource materials as possible (a minimum of three); i.e., DOT Guide Book, C.H.R.I.S. Manual, Chemtrec, etc.
- Determine if the hazard can be safely controlled or contained

-- Make any rescues in a manner that does not endanger yourself or others

-- DO NOT become contaminated; if you become contaminated

- DO NOT contaminate others
- Be completely decontaminated following proper procedures
- Warn ambulance and hospital personnel and have contaminated persons examined at a medical facility as soon as possible

-- If some patients are contaminated and others are not, keep the contaminated patients away from the uncontaminated ones

HANDLING LARGE-SCALE INCIDENTS:

-- Set up a command post in a location

- with easy access and parking
- with communication facilities; i.e., radios, telephones, etc.
- big enough to accommodate all personnel and equipment

-- Set up an evacuation center in a safe location away from the scene and place someone in charge of logging the names of the evacuees (time in/out)

-- Set up an information center away from the command post/scene and assign an information officer

-- Set up staging away from the command post/scene

-- AS SOON AS POSSIBLE, turn command of the scene over to the proper agency (CHP on roadways, Sheriff off roadways).

APPENDIX C
HAZARDOUS MATERIALS RESPONSE GUIDELINES - PROPOSED

West Plainfield Fire Protection District
Hazardous Materials Response Guidelines

02/20/03

Reviewed _____

PURPOSE
To standardize response to hazardous materials incidents and to provide a safer working environment for personnel responding to hazardous material incidents.

AUTHORITY
Federal
29 CFR 1910.120

State
8 CCR 5192(q)(6)(A)-(B)
19 CCR 2520(a)-(b)

Miscellaneous
NFPA 471
NFPA 472
NFPA 473

SITUATION
Hazardous materials are commonly used, transported, applied and stored in the West Plainfield Fire Protection District (district). No designated hazardous materials routes are available and private homes, schools, public assembly buildings and businesses are vulnerable. The district relies on the Yolo County Hazardous Materials Response Team to help mitigate incidents that require training and equipment beyond the First Responder Operations level.

The attached matrices identify the major hazardous materials located in or that travel through the district, assess vulnerability of the community to such hazardous materials, assess the risk associated with each, and identify capability shortfalls, if any. These matrices should be updated annually upon receipt of the hazardous materials inventories from the County.

ASSUMPTIONS
- An incident involving a release of hazardous materials could pose a threat to the local population or environment any time of day, any day of the week, and any week of the year. Such an incident can range from a small, minimal impact event, to a large event with potentially severe consequences. A hazardous materials incident may be caused by or occur during another emergency, such as flooding, a major fire, hurricane, or a tornado.
- A major transportation hazardous materials incident may require the evacuation of citizens at any location within the district.

- Regulated facilities will report hazardous materials inventories to the Yolo County Environmental Health Department.
- Not all hazardous materials will be placarded.
- In the event of a hazardous materials incident, we will help determine appropriate protective action recommendations for the public, disseminate such recommendations, and implement them.
- The length of time available to determine the scope and magnitude of a hazardous materials incident will impact protective action recommendations.
- During the course of an incident, wind shifts and other changes in weather conditions may necessitate changes in protective action recommendations.
- If an evacuation is recommended because of an emergency, the population in the affected area will relocate voluntarily when advised to do so by local authorities. Some residents will leave by routes other than those designated by emergency personnel as evacuation routes. Some residents of unaffected areas may also evacuate spontaneously. People who evacuate may require shelter in a mass care facility.

POLICY

The West Plainfield Fire Department (WPFD) will respond to all hazardous materials emergencies inside the district's boundaries at the First Responder Operations level. WPFD will take command of the incident as outlined in the following guidelines and will remain in command, or in a unified command structure if appropriate, until the hazard has been controlled, contained, or neutralized. WPFD may monitor cleanup but will not actively participate in cleanup operations. Personnel will be trained on these guidelines and will receive further hazardous materials training as outlined by State and Federal Regulations. Personnel will operate at all hazardous materials incidents according to these guidelines.

All other agencies responding to the incident will report to the WPFD Incident Commander for assignment within the command structure. In addition, all agencies will fall under the authority of the incident safety officer, who will be appointed by the Incident Commander (command). The incident safety officer cannot be overruled by anyone concerning matters of safety. All agency representatives will ensure that all of their employees are wearing protective clothing proper for the hazard.

These guidelines shall be reviewed and updated annually.

Exception: If the incident occurs on a roadway the California Highway Patrol or Yolo County Sheriff will assume overall command.

SCOPE

This policy will outline the "Hazardous Material" (HazMat) response of the WPFD. It will detail the standard response to a HazMat incident, what procedures are to be followed regarding recognition, notification, and containment of the hazardous material.

CRITICAL STAGE
The first few minutes after arrival of first responders at a hazardous materials incident is deemed the "Critical Stage." This stage poses the most risk to first responders who may be unprotected as they approach the scene. Necessary steps to ensure adequate protection of personnel include:

- Establish command.
- Establish a safe perimeter.
- Use proper protective clothing.
- Attempt to identify the material.

Anytime the incident commander feels that the incident is beyond the capabilities of the department's available resources, or has the potential to expand beyond the department's available resources, additional help should be requested. This may include activation of the Yolo County Hazardous Materials Response Team, as well as other resources.

CONTAINMENT STAGE
Once the incident has been isolated, efforts can be made to terminate the release or discharge of hazardous materials within the scope of the First Responder Operations level. During this stage command must continually weigh the risk of each action against the potential benefit. Command should initiate no action that is beyond the training and capabilities of the personnel on hand. Specialized equipment and personnel should be requested to contain the product as needed.

POST EMERGENCY RESPONSE OPERATIONS
After the material is contained it will be the legal responsibility of the shipper, owner, or spiller to recover the product and clean up the site. At no time will WPFD personnel actively participate in cleanup or recovery, but may remain on the scene to ensure the safety of the public and the environment. This may include maintaining command over all abatement and removal operations.

SCENE MANAGEMENT
Incident Command System
The first WPFD unit on the scene will establish command of the incident. WPFD will remain in command of incidents within the district's boundaries until the threat to life, property and/or the environment has passed. At incidents that involve more than one jurisdiction or at incidents on the roadways, a joint command post will be established.

Command Post
A command post will be established at least 200 feet from the hot zone access point. There should be sufficient room between the command post and the hot zone for the setup of HazMat and decontamination operations. The command post site should have easy access for incoming vehicles. All responders from all agencies will either report to the command post or staging, as directed by command.

Incident Commander's Responsibilities
Command is responsible for the following:

- Establish and expand command as necessary, including appointment of a safety officer. (When no safety officer is designated, the incident commander will serve as safety officer.)
- Relay to responders information on how to approach the scene safely.
- Identify "incident level."
- Ensure that all personnel are in proper protective clothing.
- Ensure that all zones and access points are respected and that access is restricted to authorized personnel in proper protective clothing.
- Ensure that all responders are briefed on the hazards of the incident site.
- Establish and relay goals to other agencies.
- Provide for proper termination of the incident.

RESPONSE LEVEL
The WPFD shall be considered equipped and trained to operate at the First Responder Operations level. This will encompass all defensive skills such as recognition, notification of individuals or teams with offensive skills and equipment, containment as appropriate, and minimizing harm to citizenry by universally accepted methods for such level of service delivery.

INCIDENT CLASSIFICATION
Level I
Hazardous materials incidents which can be correctly contained, extinguished and/or abated utilizing equipment, supplies and resources immediately available to the WPFD. The incident is limited in scope and potential effects, involves a limited area and/or limited population, and evacuation or in-place sheltering is typically limited to the immediate area of the incident. Typical Level I responses include small fuel spills, natural gas leaks, and limited spills of pesticides.

Level II
Hazardous materials incidents which can only be identified, tested, sampled, contained, extinguished and/or abated utilizing the resources of a full Hazardous Materials Response Team (Yolo County Hazardous Materials Response Team). It may require a sizeable multi-agency response and limited assistance from local agencies, contractors and state or federal agencies.

Level III
A hazardous materials incident which is beyond the scope of a single Hazardous Materials Response Team (Yolo County Hazardous Materials Response Team). This incident requires significant external assistance from local agencies, contractors and state or federal agencies.

RESPONSE GUIDELINES

Response (to Station)

All responding personnel will report to the station to receive assignments. WPFD officers will decide on the type and direction of response, after considering atmospheric conditions, i.e., wind direction, rain, terrain, and the nature of the reported hazardous material. Respond so as to avoid the spill, gas cloud, etc

Exception: An alternate gathering point will be selected while en route if the incident potentially involves the station.

Response to, and Arrival on, Scene

- Approach from uphill and upwind.
- Establish command.
- Established hot zone and deny access.
- Establish a means of egress in advance. (Three long blasts of the air horn is the evacuation signal. All personnel will immediately leave the area via the egress route when the evacuation signal is sounded.)
- Face all vehicles away from the site.

Mitigation of Level I Incidents

- Set up command post (CHP is incident command on highways; Sheriff, private areas).
- Assign a safety officer.
- Set up protective perimeters:
  - Stay out of the area if possible.
  - Keep all non-emergency persons and non-assigned, non-essential department personnel out of the area.
  - Personnel not specifically trained are not to enter the warm or hot zones.
- Evacuate the surrounding areas if necessary.
- Try to SAFELY identify the material and its hazards:
  - Use binoculars, log sheets, bills of lading.
  - Determine the type of hazard: health, fire, explosion.
  - When determining the type of hazard, use as many resource materials as possible (a minimum of three); i.e., DOT Guide Book, C.H.R.I.S. Manual, Chemtrec, etc.
- If the product cannot be identified, Guide 111 of the ERG should be followed when making operational decisions.
  - At Woodland Aviation use CO2 or dry chemical for small fires and foam for large fires (most products located at Woodland Aviation react negatively to pure water.
- Determine if the hazard can be safely controlled or contained.
- Call fire dispatch and have them notify the proper agencies:
  - Environmental Health and Safety (advisory capacity only).
  - Yolo County Ag Department.
  - CHP.
  - Public Works.
  - Yolo County Sheriff.
  - Any other necessary agencies (Fish and Game, etc.)

- Make any rescues in a manner that does not endanger yourself or others:
  - DO NOT become contaminated; if you become contaminated:
    - DO NOT contaminate others.
    - Be completely decontaminated following proper procedures.
    - Warn ambulance and hospital personnel and have contaminated persons examined at a medical facility as soon as possible.
  - If some patients are contaminated and others are not, keep the contaminated patients away from the uncontaminated ones.

Mitigation of Level II and Level III Incidents

- Respond as for "Mitigation of Level I Incidents."
- Upon determination that the materials cannot be properly identified by WPFD personnel or upon recognition that material poses an imminent threat or danger to life, property and/or the environment and mitigation efforts are beyond the resources available to WPFD personnel, request response by the Yolo County Hazardous Materials Response Team.
- Provide the following information when requesting the Yolo County Hazardous Materials Response Team:
  - Nature of the emergency:
  - Whether requesting help only with identification or full team response.
  - Incident location.
  - Injuries, if any.
  - Description of the threat to life, property and/or the environment.
  - Material involved, if known, and any additional relevant information.
  - Dispatch frequency, tactical frequency, incident name, incident commander information, cellular telephone number, command post location, and the location. of staging.
- Set up and monitor incident control zones:
  - Hot Zone: The area around the hazard that is contaminated or could become contaminated.
  - Warm Zone: This is the transition area between the hot zone and the cold zone. Unauthorized personnel shall not enter the warm zone.
  - Cold Zone: This is an area free from any possible contamination and that is not likely to become contaminated at a later time. Access to the cold zone must still be controlled to allow for uninterrupted operations. Personnel operating in the cold zone should not require any level of personal protective clothing.
  - Boundaries for all zones should change as necessary as the incident expands and contracts, and as weather changes.

Isolation and Evacuation

Isolation is the immediate removal or protection in place of all persons in the area of danger. Refer to the ERG for isolation distances. For unknown materials 500 feet in all directions is the recommended isolation distance.

Evacuation is considered a long term operation and generally follows isolation of the incident site. Consult the ERG for evacuation distances. Remember that evacuation may take a long time

and is very manpower intensive. Command must plan for and evacuate areas before they become threatened. Once an area is contaminated personnel will not be able to enter it to perform evacuation.

Rescue and EMS
Rescue of victims at a hazardous materials incident should not be attempted if it places rescue personnel at unnecessary risk. Initial efforts should be focused on removing ambulatory victims to the area of refuge and out of immediate danger. Victims that are trapped or cannot remove themselves from danger must be evaluated on a case-by-case basis. When the probability is high that the victim is already dead or will not survive, or that the rescue effort will place rescue personnel at undue risk, no rescue attempt should be made.

The area of refuge is part of the hot zone and must be monitored. Contaminated victims should be decontaminated before being treated. Rescue personnel that become contaminated must remain in the area of refuge and must also be decontaminated. Once decontaminated, victims can be treated in the area of refuge or transferred to a medical unit for transport. Contaminated victims will not be transported.

EMERGENCY DECONTAMINATION

Decontamination is the process of removing or neutralizing contaminants that have accumulated on personnel and equipment. It is critical to the health and safety of personnel and citizens at emergency response sites.

In an emergency situation the primary concern is to prevent the loss of life or severe injury to operating personnel. If immediate treatment is required to save a life, decontamination can be, in some cases, delayed until the victim is stabilized. If decontamination can be performed without interfering with essential life-saving techniques or first aid, or if a worker has been contaminated with an extremely dangerous material that could cause severe injury or loss of life, emergency decontamination procedures must be performed immediately. Clothing must be removed from the contaminated victims prior to transporting. If this is the case, the patient’s dignity should be considered as much as possible.

Emergency decontamination will consist of a sixty second flush administered from a handline or other sufficient water source. This decontamination will take place in the hot zone, near the area of refuge. Anyone not requiring immediate medical attention will be decontaminated and then isolated in the area of refuge for further decontamination. Patients requiring immediate medical attention will be decontaminated as much as possible before being treated and transported.

Exposure of Personnel
The EPA recommends an exposure report be completed anytime an employee is exposed to a hazardous substance, even if they are wearing full protective equipment. Form, “Hazardous Materials Individual Record of Exposure,” is available at the Fire Station and should be filled out immediately after personnel return to the station. It is the responsibility of the Incident Commander to see that all exposed personnel complete the form and turn it in to the Chief. The Chief will file the form. These records will be kept as required by state and federal regulations.

Contaminated Equipment
All equipment contaminated at the incident site, including personal protective equipment and clothing, will be placed in the designated decontamination area. This equipment will be evaluated and either be decontaminated or disposed of. If an employee feels that his personal protective equipment or other equipment has been contaminated after leaving the incident site, that equipment will be isolated in place and the Chief notified immediately. Do not move the contaminated equipment, as that will only spread the contamination. The contaminated equipment will then be evaluated.

COST RECOVERY

The company or individual responsible for the hazardous materials release is liable for the cost of clean-up, structural and environmental damage, and personal injury or death. Responsible departments as required by law, regulation, or department procedures shall maintain records of training. Documentation of response expenses shall also be maintained by the responding or supporting department. If the responsible party cannot be identified, the district may be eligible for reimbursement of certain hazardous materials response costs by the US Environmental Protection Agency (EPA); this program requires timely submission of an application with supporting data.

TRAINING

- Training, at a minimum, shall conform to the requirements of 8 CCR 5192(q), 29 CFR 1910.120(q), NFPA 472 (Chapters 5 and 7, NFPA 473 (Chapter 4) for hazardous materials responders - First Responder Operations level.
- Training shall be provided toward the specific hazards identified each year in the attached matrices.
- Training shall also include elements of this Standard Operating Procedure and procedures for reporting and handling emergency incidents.
- The chief is responsible for determining the level of training required, implementing the required training, and certifying that members of the organization have the competencies required. Annual refresher training must be provided sufficient to maintain competencies or employees must demonstrate required competencies annually and have such competencies certified.
- Incident Commanders who assume control of the incident scene (beyond the first responder awareness level) shall receive at least twenty-four (24) hours of training equal to the first responder operations level. In addition, the chief must certify that personnel in this position are able to implement the incident command system and emergency response plans and procedures, understand the risks associated with working in chemical protective clothing and the importance of decontamination.

MATRIX 1 - HAZARD IDENTIFICATION

Potential Hazards

HAZARD	HAZARD PROBABILITY	ESTIMATE OF AFFECTED POPULATION (worse-case scenario)
Diesel transport/storage accident	**2**	< 100
Gasoline transport/storage accident	**2**	<100
Propane transport/storage accident	**2**	<100
Fertilizer transport/storage accident	**2**	Thousands *
Pesticide transport/storage accident	**2**	300-500
Jet fuel transport/storage accident	**1**	<100
Fertilizer application accident	**3**	Thousands *
Pesticide application accident	**3**	300-500
Gas pipeline (SMUD)	**2**	Thousands **
Agrichem Services, Inc.	**1**	300-500
Antibodies, Inc.	**1**	< 100
Gene W. Stiles & Sons	**1**	< 100
Hans Hilleby Farms	**1**	<100
Woodland Aviation	**2**	300-500

Table Legend:

1 = Unlikely
2 = Possible
3 = Likely

* No way to estimate accurately, depends on material being transported / applied, wind direction, etc.
** No way to estimate accurately; depends on length of time before SMUD can affect repairs and how much product was in the pipeline

MATRIX 2 - VULNERABILITY ASSESSMENT

Potential Hazards

	Diesel transport/storage accident	Gasoline transport/storage accident	Propane transport/storage accident	Fertilizer transport/storage accident	Pesticide transport/storage accident	Jet fuel transport/storage accident	Fertilizer application accident	Pesticide application accident	Gas pipeline (SMUD)	Agrichem Services, Inc.	Antibodies, Inc.	Gene Stiles & Sons	Hans Hilleby Farms	Woodland Aviation
IMPACT RATING														
Danger / Destruction (High=3; Moderate=2; Low=1)	2	2	2	2	2	2	2	2	2	2	3	2	2	3
Economic (Permanent=3; Temporary=2; Short-term=1)	1	1	1	1	1	1	1	1	2	1	1	1	1	1
Environmental (High=3; Moderate=2; Low=1)	1	1	1	2	2	1	2	2	2	1	1	1	1	1
Social (High=3; Moderate=2; Low=1)	1	1	1	1	1	1	1	1	2	1	1	1	1	1
Political Planning Level (Federal=3; Regional=2; Local=1)	1	1	1	1	1	1	1	1	2	1	1	1	1	1
TOTAL VULNERABILITY RATING	6	6	6	7	7	6	7	7	10	6	7	6	6	7
RANK	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**2**	**1**	**1**	**1**	**1**	**1**
RANK - 5 to 8 LOW (1); 9 to 11 MODERATE (2); 12 to 15 HIGH (3)														

MATRIX 3 - RISK RATING ASSESSMENT

Potential Hazards

HAZARD	Probability of Occurrence			Vulnerability			Risk
	Likely (3)	Possible (2)	Unlikely (1)	High (3)	Moderate (2)	Low (1)	Rating *
Diesel transport **		2				1	2
Gasoline transport **		2				1	2
Propane transport **		2				1	2
Fertilizer transport **		2				1	2
Pesticide transport **		2				1	2
Jet fuel transport **			1			1	1
Fertilizer application	3					1	3
Pesticide application	3					1	3
Gas pipeline (SMUD)		2			2		4
Agrichem Services			1			1	1
Antibodies, Inc.			1			1	1
Gene W Stiles & Sons			1			1	1
Hans Hilleby Farms			1			1	1
Woodland Aviation		2				1	2

* Probability x Vulnerability
** Includes storage

MATRIX 4 - CAPABILITY SHORTFALL

Potential Hazards

	Type 1 Engine	Type 2 Engine	Type 3 Engine	Water	Heavy Rescue	Truck	HazMat Response Team	Command Officers	Firefighters
Availability (includes auto/mutual aid resources)	6	6	8	14	1	2	1	13	90
Anticipated loss	4	0	0	0	0	2	0	2	22
Availability after situation	2	6	8	14	1	0	1	11	68
Critical risk requirement	0	5	5	8	1	0	1	7	40
Safety factor (%)	25	25	25	25	25	25	25	25	25
Critical risk requirement with safety factor	0	6.25	6.25	10	1.25	0	1.25	1.75	50
Shortfall		1			1		1		

APPENDIX D
HAZARDOUS MATERIALS INDIVIDUAL RECORD OF EXPOSURE

West Plainfield Fire Protection District **02/20/03**
Hazardous Materials Response Guidelines Reviewed _____

NAME _____ DATE _____

INCIDENT NO _____ INCIDENT LOCATION _____

Material(s) Involved

Material 1 Trade/Common Name _____

Quantity _____

Form: ☐ Solid ☐ Liquid ☐ Gas ☐ Powder ☐ Mist
☐ Granular ☐ Other

Material 2 Trade/Common Name _____

Quantity _____

Form: ☐ Solid ☐ Liquid ☐ Gas ☐ Powder ☐ Mist
☐ Granular ☐ Other

Exposure Route

Material 1 ☐ Ingestion ☐ Inhalation ☐ Absorption

Material 2 ☐ Ingestion ☐ Inhalation ☐ Absorption

Patient Symptoms

Attach EMS Report

Use of Protective Clothing

Describe protective clothing worn at time of exposure _____

Describe Circumstances of Exposure

_____

_____

PERSON COMPLETING REPORT _____

Date Report Completed _____

APPENDIX E
HAZARDOUS REPORTED TO YOLO COUNTY DEH

HAZARDS REPORTED TO YOLO COUNTY DEH

	Largest Container	Max Daily Amount
A56B - BFGoodrich	.25	3
Acetylene	70	440
Alcohol - Denatured	5	55
Alcohol - Isopropyl	1	55
Alodyne	1	8
Antifreeze	55	55
Cabon Dioxide	250	2500
De-ice Fluid Tsk	1	55
Diesel #2	16000	16000
Diuron	30	45
Gasoline	1000	19000
Hydraulic Oil	1	5
Insulating Oil W/0-4.9P	4328	4328
Insulating Oil W/50-49	15	60
JFM801A Base	.5	2
Laminar X500 Hardner	.25	2
Methyl Ethyl Ketone	1	55
Mineral Oil		30
Motor Oil	3000	1000
Navel Jelly	.25	1
Nitrogen	228	228
Oxygen	249	753
Paint - Aircraft	100	304
Prism ® 401 Surf-Insens	.5	1
Propane	9012	9012
Solvent	100	55
Stoddard Solvent	55	45
Turbo Fuel A - Jet A	1,000	12,000
Turbo Oil 2380 Synthetic	2	0
Urea	50	3000
Waste Fuel	2	55
Waste Hydraulic Oil	2	55
Waste Oil	1	55
Waste Petroleum Oil	1	55
Wet-Cell Batteries	1	2